Abstract

The present invention is directed to organic photosensitive optoelectronic devices and methods of use for determining the position of a light source. Provided is an organic position sensitive detector (OPSD) comprising: a first electrode, which is resistive and may be either an anode or a cathode; a first contact in electrical contact with the first electrode; a second contact in electrical contact with the first electrode; a second electrode disposed near the first electrode; a donor semiconductive organic layer disposed between the first electrode and the second electrode; and an acceptor semiconductive organic layer disposed between the first electrode and the second electrode and adjacent to the donor semiconductive organic layer. A hetero-junction is located between the donor layer and the acceptor layer, and at least one of the donor layer and the acceptor layer is light absorbing. The OPSD has an optical beam spatial resolution of 20 μm and measurements are insensitive to fluctuations in incident light beam intensity and background illumination. The response of the OPSD shows high linearity, low positional error, high spatial resolution, and good beam tracking velocity. The OPSDs exhibited linearities and positional uncertainties of <1%.